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PATENT APPLICATION
Docket No. 9898-217
Client No. SS-16232-US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Jae-Hyun Joo and Wan-Don Kim		
Serial No.	10/055,270	Examiner:	Mai, Anh D
Confirmation No.	6757		
Filed:	January 22, 2002	Art Unit:	2814
For:	METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A METAL-INSULATOR-METAL CAPACITOR		

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL LETTER

Enclosed for filing in the above-referenced application are the following:

☒ Statement under MPEP 713.04
☒ Appellant's Amended Brief (in triplicate)
☒ Any deficiency or overpayment should be charged or credited to deposit account number 13-1703.

Customer No. 20575

Respectfully submitted,

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Reg. No. 38,610

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Date: April 14, 2004

Adrienne Chocholak

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STATEMENT UNDER MPEP 713.04

Applicant's representative discussed with the Examiner the substance of the amendments to claims made within the Appeal Brief under Section 112, second and first paragraphs. The substance of Applicant's arguments are reproduced in the Amended Appeal Brief and are included in part herein.

Claims presented for Appeal are 1, 2, 4, 6-15, 17-20 and 24-32. Claims that would have been amended to place in better form for appeal include claims 7, 18, and 24-28. All pending claims are rejected.

An appeal of these rejections have been made to the Board of Patent Appeals and Interferences and an Appeal Brief in support submitted January 7, 2004. The Examiner issued a communication dated March 17, 2004 denying appeal on the grounds that (1) the Brief does not solely respond to matters applied in the Final Rejection, and (2) the Brief contains amendments to the claims which were not included in the Final Rejection requiring further search and consideration.

Although no amendment can be made as a matter of right, amendments to claims may be admitted even after Appeal upon a showing of good and sufficient reasons why they are necessary and were not earlier presented. The current claim amendments would be required to address §112, first and second paragraph first identified in the Final Rejection. Applicant has not yet had a chance to overcome such rejections and thus the amendments to the claims could not have been earlier presented. Addressing such issues now, in the initial appeal (or in a response to Final Office Action), would allow the Board of Patent Appeals and Interferences to properly rule on any issues concerning claim rejections in view of the prior art, namely the outstanding §103(a) issues.

The grounds discussed for entry of the claim amendments are summarized as follows:

A. Entry of Amendment Is Proper

The Amendments to the claims do not entail new issues or require further search and consideration. Instead, the amendments place the claims in better form for Appeal by addressing the §112, first and second paragraph issues identified by the Examiner in the Final Rejection. The amendments could not have been submitted earlier since the specific grounds for the rejections were not expressed. That is: (1) the Examiner had not until the Final Rejection noted that the "inherent" language in the claims is not supported in the application, and (2) a claim cancellation and inadvertent non-insertion of claim language into dependent claims resulted in the 112, second paragraph rejection.

Turning to the first issue, the amendment language is not only fully supported in the application, but the old language was clearly identified as meaning essentially the same as the current language presented earlier in the prosecution. Accordingly, no further search or consideration should be necessary as the issues have already been considered. As for the second issue, not further consideration of amended claims 26-29 should be necessary since the scope of those claims is the same as those existing prior to the cancellation the claim from which they depended. We take these issues in reverse order.

B. There is Now Proper Antecedent Basis in Claims 26-29

Claims 26-29 have been rejected under §112, second paragraph for providing insufficient antecedent basis for the terms "selected atmosphere" and "thermal annealing". Such antecedent basis previously existed in claim 21 from which the claims depended. Prior cancellation of claim 21 in an earlier action caused the present rejection and applicants inadvertently did not add

antecedent support into the remaining claims. Antecedent basis for the two terms would have been added into claims 26-28 (claim 29 depends from claim 28). No new material has been added and no further prior art search should be necessary as the wording and scope is entirely reflective of wording and scope found in the claims prior to cancellation of previously presented claim 21. Removal of the rejection is henceforth respectfully requested.

C. "Inherent Temperature of Crystallization Annealing" is Properly Understood to Mean "Conventional Crystallization Annealing Temperature"

Claims 7, 18, 24 and 25 are rejected under 25 USC §112, first paragraph, on the grounds that the specification does not provide support for the limitation.

On the contrary, the term "inherent temperature of crystallization annealing" should be well known to those skilled in the semiconductor and material science arts as the temperature at which a particular material by itself would undergo crystallization annealing. Use of the term "inherent" should not constitute new matter since such a term is well known in the art. An explanation of the difference between the crystallization temperature used in the inventive method and the *inherent* crystallization temperature of the material was described in previous responses. That is, it has been shown experimentally that the crystallization temperature for the dielectric is actually lower than the inherent crystallization temperature of the material due to formation of a dielectric (e.g. tantalum oxide) along a grain boundary of the pre-annealed lower electrode where the dielectric becomes partially crystallized. This partial crystallization decreases the crystallization temperature so that the actual crystallization temperature is lower than the inherent crystallization temperature.

The specification as filed makes reference to and provides specific and unmistakable support and explanation for the concept of a "conventional crystallization annealing temperature" on page 7, line 17. The "inherent" terminology is intended to be, and would be understood by those knowledgeable in the art to be, identical in scope and definition to the "conventional" language cited in the specification. As stated in a prior response:

> A further limitation, that of performing a "crystallization annealing" can be found in amended claims 7, 18, and to a more specific extent independent claim 20. Referring to the crystallization annealing of the capacitor dielectric layer, by the pre annealing, the crystallization temperature of the capacitor dielectric layer is lowered (see, e.g., page 7, line 16). That is, since the capacitor dielectric layer is grown along a grain boundary of the pre-annealed lower electrode, the capacitor dielectric layer becomes partially crystallized. This partial crystallization decreases the crystallization temperature. When the temperature of the crystallization of the capacitor dielectric layer is lowered, the leakage current substantially decreases, which is well known in the art. Such a matter is

one of the features of the present invention. Therefore, the claims have been amended to reflect that the crystallization of the capacitor dielectric layer starts at a ***lower*** temperature than the *inherent crystallization* temperature of the capacitor dielectric layer (also claim 24). [Response to OA dated March 4, 2003]

So that there is no further confusion, however, claims 7, 18, 24, and 25 would have been amended to substitute the "conventional" language for the "inherent" language. This does not add new matter nor require and additional prior art search, but is intended solely for the purpose of placing the claims in better form for Appeal.

No Agreement was reached with respect to the above issues presented.

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Respectfully submitted,

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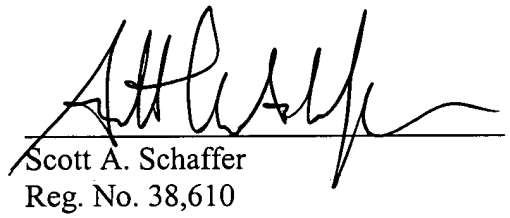

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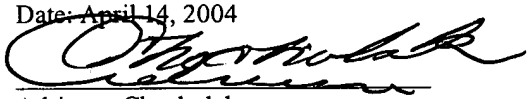

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